material on said first active energy setting material is performed by a flexographic printing method.

4. (Amended) The method of manufacturing the ink-jet recording head according to claim 1, wherein said step of applying an ink-repellent second active energy setting material on said first active energy setting material is performed by a method of transforming said second active energy material into a dry film and applying said film on said base plate.

5. (Amended) The method of manufacturing the ink-jet recording head according to claim 1, wherein said first active energy setting material is an epoxy resin cured by cationic polymerization.

6. (Amended) The method of manufacturing the ink-jet recording head according to claim 1, wherein said ink-repellent second active energy setting material is an epoxy resin cured by cationic polymerization.

REMARKS

Claims 1-6 are presented for examination, Claim 7 having been withdrawn as being drawn to a non-elected invention. Claims 1-6 have been amended to attend to formal matters, with Claim 1 also being amended to define more clearly what Applicant regards as his invention. Claim 1 is independent.

The Abstract, title and Claims 2-6 were objected to on formal grounds. In response to these objections, the Abstract, title and Claims 2-6 have been amended, and the Examiner's suggestions have been adopted where provided. It is believed that all of these objections have been obviated, and they are therefore respectfully requested to be withdrawn.

The specification was objected to as failing to provide proper antecedent basis for the claimed subject matter. Specifically, the Office Action stated that "the claimed terms of 'first active energy setting material' (line 7 of Claim 1) and 'ink-repellent second active energy setting material' (line 9 of Claim 1)" are not recited in the specification.

Applicant wishes to point out that these terms are used and explained in the specification, for example, at page 4, line 12 - page 7, line 15 (see especially page 5, lines 5-8 and page 6, line 5 - page 7, line 15) and page 12, line 20 - page 13, line 28. The term "active energy setting material" refers to a material that is set (or cured) by application of active energy (e.g., by exposure to light energy). Applicant submits that this terminology would be known by one skilled in the art, as evidenced, for example, by its use in U.S. Patent 4,536,468 (*Yasui et al.*) (see abstract and col. 6, lines 26-29), one of the references cited in the Office Action.

It is believed that this objection has been obviated, and it is therefore respectfully requested to be withdrawn.

Claims 1-6 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In response to this rejection, Claims 2-6 have been amended in view of all of the points raised hereunder with respect to those claims.

However, Applicant respectfully traverses this rejection with respect to Claim 1. The Office Action states that while line 16 of Claim 1 recites a step of "removing said liquid path

pattern", the disclosure teaches that only a portion of the liquid path pattern is removed. On this point, the Office Action suggests that the rendering in Fig. 4, whereby only a portion of photosensitive layer 8 has been removed, corresponds to the step of "removing said liquid path pattern". However, Applicant wishes to point out that Fig. 4 corresponds to the step of "forming a liquid path pattern ...", recited in lines 5 and 6 of Claim 1 (see the reference to Fig. 4 at page 10, lines 5-8 of the specification). The step of "removing said liquid path pattern" is discussed in the specification, for example, at page 14, lines 1-5.

Accordingly, it is believed that the rejection under Section 112 has been obviated, and its withdrawal is therefore respectfully requested.

Claims 1, 2, 4 and 5 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,458,254 (*Miyagawa et al.*). Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Miyagawa et al.* in view of U.S. Patent 4,429,027 (*Chambers, Jr. et al.*). Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Miyagawa et al.* in view of U.S. Patent 4,536,468 (*Yasui et al.*). Applicant respectfully traverses these rejections.

The aspect of the invention presented in Claim 1 is directed to a method of manufacturing an ink-jet recording head comprising the steps of preparing a base plate having an ink ejection pressure generating element, forming a liquid path pattern on the base plate with use of a soluble resin, by applying light through a mask and developing afterward, applying a first active energy setting material on the base plate and the liquid path pattern, applying an ink-repellent second active energy setting material on the first active energy setting material, exposing the first active energy setting material and the ink-repellent second active energy setting material, developing the first active energy setting material and the ink-repellent second active

energy setting material so as to form an ejection port above the ink ejection pressure generating element, and removing the liquid path pattern. According to the method, the ink-repellent second active energy setting material is applied through a drying process.

Miyagawa et al. relates to a method for manufacturing a liquid jet recording head. According to the method, an ink flow passage pattern 4 is formed on a substrate 1 by a dissolvable resin, a resin layer 5 is formed on pattern 4, a silicon oxide film 6 is formed on resin layer 5, and a resist is formed on film 6 (see, e.g., col. 9, line 50 - col. 12, line 40 and col. 15, lines 41*ff*). Ink discharging ports 7 are formed by oxygen plasma etching, using the resist as a mask (see, e.g., col. 11, line 40 - col. 12, line 8). That is, according to *Miyagawa et al.*, oxygen plasma etching is necessary to form the ink discharge ports. Accordingly, *Miyagawa et al.* does not provide the method of Claim 1, which recites that an ejection port is formed by a series of steps not including oxygen plasma etching.

In addition, silicon oxide film 6 does not correspond to the ink-repellent second active energy setting material recited in Claim 1. *Miyagawa et al.* states, for example, that, first, silicon oxide film 6 is formed on the hardened covering resin layer, and then, on the aforesaid silicon oxide film, a positive photoresist is coated (col. 16, lines 13-21). Thus *Miyagawa et al.* does not mention a material that is an ink-repellent second active energy setting material. Accordingly, Applicant submits that nothing in *Miyagawa et al.* would teach or suggest a step of applying an ink-repellent second active energy setting material on a first active energy setting material.

According to Applicant's understanding, *Chambers, Jr. et al.* relates to a photoimaging process, whereby a nonvisible latent image is toned and the toner is transferred to a

layer or cover sheet to form a radiation-opaque photomask. Even if *Chambers, Jr. et al.* be deemed to teach a process in which a photoresist or photomask is created directly on a surface to be processed, this reference is not seen to remedy the deficiencies of *Miyagawa et al.*

According to Applicant's understanding, *Yasui et al.* relates to a method of forming a resist pattern, wherein a pattern is printed on a substrate by a lithographic technique using a curable resist ink and the printed pattern is cured by irradiation and/or heating. Even if *Yasui et al.* be deemed to suggest that photoresists can comprise compositions of either silicon resins or epoxy resins, which are cationic polymerized compounds, this reference is not seen to remedy the deficiencies of *Miyagawa et al.*

Since none of the cited references, whether taken alone or in combination (even assuming such combination were permissible), contain all of the features of Claim 1, that claim is believed to be allowable over the cited prior art.

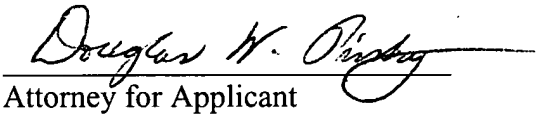
A review of the other art of record has failed to reveal anything that, in Applicant's opinion, would remedy the deficiencies of the references discussed above, as applied against Claim 1. Therefore, that claim is respectfully submitted to be patentable over the art of record.

The other rejected claims in this application depend from Claim 1, and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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APPENDIX

VERSION SHOWING CHANGES MADE TO CLAIMS

1. (Amended) A method of manufacturing an ink-jet recording head comprising the steps of[;]:

preparing a base plate having an ink ejection pressure generating element[,];

forming a liquid path pattern on said base plate with [the] use of a soluble resin, by applying light through a mask and developing afterward;

applying a first active energy setting material on said base plate and said liquid path pattern[,];

applying an ink-repellent second [energy] active energy setting material on said first active energy setting material[,];

exposing said first active energy setting material and said ink-repellent second [energy] active energy setting material[,];

developing said first active energy setting material and said ink-repellent second active energy setting material so as to form an ejection port above said ink ejection pressure generating element[,]; and

removing said liquid path pattern,

wherein said ink-repellent second [energy] active energy setting material is applied through a drying process.

2. (Amended) [A] The method of manufacturing [an] the ink-jet recording head according to [the] claim 1, wherein[; an] said step of applying [method of said] an ink-repellent second [energy] active energy setting material on said first active energy setting material is [characterized] performed by a method of spraying [said] fine particles of said second material.

3. (Amended) [A] The method of manufacturing [an] the ink-jet recording head according to [the] claim 1, wherein[; an] said step of applying [method of said] an ink-repellent second [energy] active energy setting material on said first active energy setting material is [characterized] performed by a flexographic printing method.

4. (Amended) [A] The method of manufacturing [an] the ink-jet recording head according to [the] claim 1, wherein[; an] said step of applying [method of said] an ink-repellent second [energy] active energy setting material on said first active energy setting material is [characterized] performed by a method of transforming said second active energy material into a dry film and [by a method of] applying said film on said base plate.

5. (Amended) [A] The method of manufacturing [an] the ink-jet recording head according to [the] claim 1, wherein said first active energy setting material is an epoxy resin cured by [the] cationic polymerization.

6. (Amended) [A] The method of manufacturing [an] the ink-jet recording head according to [the] claim 1, wherein said ink-repellent second active energy setting material is an epoxy resin cured by [the] cationic polymerization.